

CLAIMS

1 1. An apparatus for controlling an actuator system, the actuator system having an electrical
2 actuator in hydraulic communication with a hydraulic actuator and a hydraulic source, the
3 apparatus comprising:

4 a source of electrical power;

5 a controller module in electrical communication with the source of electrical power to
6 receive power therefrom and in electrical communication with the electrical actuator; and

7 a transceiver in communication with the controller module, the transceiver adapted for
8 wireless communication with a remote transceiver, the wireless communication including
9 transfer of control data and feedback data with the remote transceiver, the controller module
10 sending a control signal to the electrical actuator in response to control data received from the
11 remote transceiver.

1 2. The apparatus of claim 1 further comprising the remote transceiver.

1 3. The apparatus of claim 1 wherein the source of electrical power comprises:

2 a hydraulic motor in communication with the hydraulic source; and

3 an alternating current (AC) generator in mechanical communication with the hydraulic
4 motor.

1 4. The apparatus of claim 3 wherein the source of electrical power further comprises a boost
2 rectifier in electrical communication with the AC generator.

1 5. The apparatus of claim 2 further comprising a remote controller module in
2 communication with the remote transceiver.

1 6. The apparatus of claim 5 further comprising an operator control module in
2 communication with the remote controller module.

1 7. The apparatus of claim 1 wherein the controller module comprises a digital signal
2 processor.

1 8. The apparatus of claim 1 further comprising a sensor in communication with the
2 controller module.

1 9. The apparatus of claim 8 wherein the sensor comprises one of a proximity switch, a
2 temperature sensor, a pressure sensor, a flow sensor and a level switch.

1 10. The apparatus of claim 1 further comprising the electrical actuator.

1 11. The apparatus of claim 10 wherein the electrical actuator is a solenoid valve.

1 12. An apparatus for controlling the operation of an actuator system of a top drive, the
2 actuator system having an electrical actuator and a hydraulic actuator in hydraulic
3 communication, the electrical actuator being in hydraulic communication with a hydraulic source
4 through a rotary seal, the apparatus comprising:

5 a source of electrical power;

6 a first controller module in communication with the source of electrical power and
7 the electrical actuator; and

8 a first transceiver configured for communication with a second transceiver
9 through a wireless communication link to transfer control data and feedback data, the first
10 controller module sending a control signal to the electrical actuator in response to the
11 control data.

1 13. The apparatus of claim 12 wherein the source of electrical power comprises:
2 a hydraulic motor in communication with the hydraulic source; and
3 an alternating current (AC) generator in mechanical communication with the hydraulic
4 motor.

1 14. The apparatus of claim 13 wherein the source of electrical power further comprises a
2 boost rectifier in electrical communication with the AC generator.

1 15. The apparatus of claim 12 further comprising the second transceiver.

1 16. The apparatus of claim 15 further comprising a second controller module in
2 communication with the second transceiver module.

1 17. The apparatus of claim 16 further comprising an operator control module in
2 communication with the second controller module.

1 18. The apparatus of claim 12 further comprising a sensor in communication with the first
2 controller module.

1 19. The apparatus of claim 18 wherein the sensor is one of a proximity switch, a temperature
2 sensor, a pressure sensor, a flow sensor and a level switch.

1 20. A method of controlling an actuator system having a hydraulic actuator, the method
2 comprising:

3 providing a hydraulic flow to the actuator system;
4 generating electrical power from the hydraulic flow at the actuator system;
5 receiving a data signal from a remote wireless transceiver; and
6 controlling the hydraulic actuator in response to the received data signal and the electrical
7 power.

- 1 21. The method of claim 20 wherein the received data signal comprises control data.
- 1 22. The method of claim 20 further comprising transmitting a data signal from the actuator
2 system to the remote wireless transceiver.
- 1 23. The method of claim 22 wherein the transmitted data signal comprises sensor data.
- 1 24. The method of claim 23 wherein the sensor data is indicative of at least one of actuator
2 speed, hydraulic flow rate, temperature, position and component binary state.
- 1 25. An apparatus for controlling a hydraulic actuator, the apparatus comprising:
 - 2 means for converting hydraulic flow to electrical power;
 - 3 means for receiving control data from a remote transmitter over a wireless link;
 - 4 means for generating an electrical control signal in response to the electrical power and
5 the received control data; and
 - 6 means for operating the hydraulic actuator responsive to the electrical control signal.
- 1 26. The apparatus of claim 25 further comprising means for transmitting sensor data to the
2 remote transmitter over the wireless link.